Fig. 1

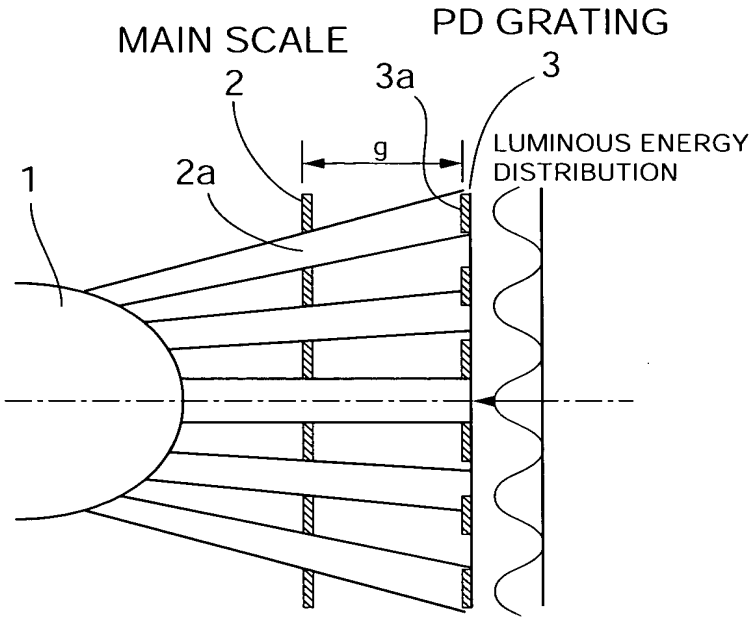

MAIN SCALE
PD GRATING
2
3a
3
g
LUMINOUS ENERGY
DISTRIBUTION
1
2a

Fig. 2

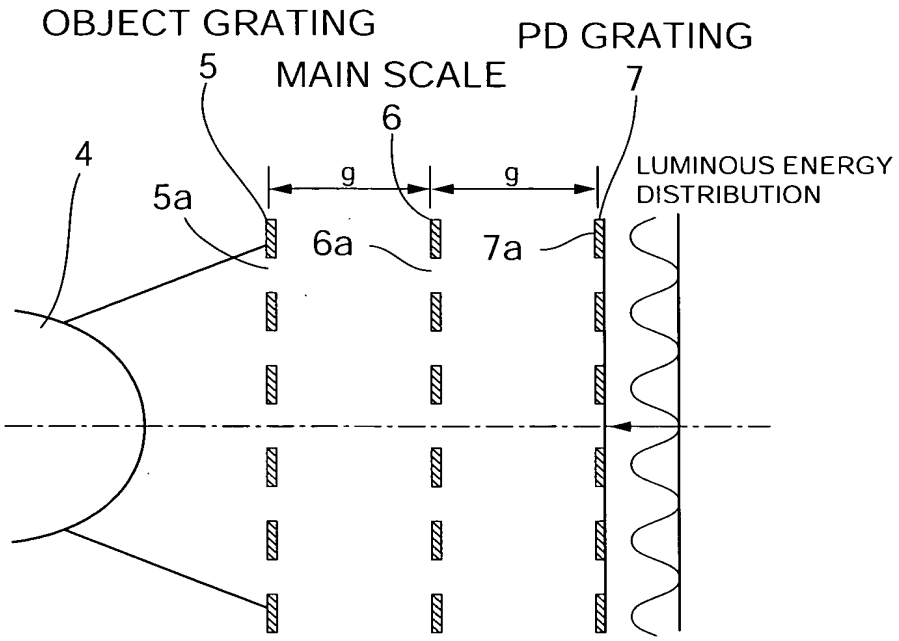

OBJECT GRATING
5
MAIN SCALE
6
PD GRATING
7
4
5a
g
g
LUMINOUS ENERGY DISTRIBUTION
6a
7a

Fig. 3

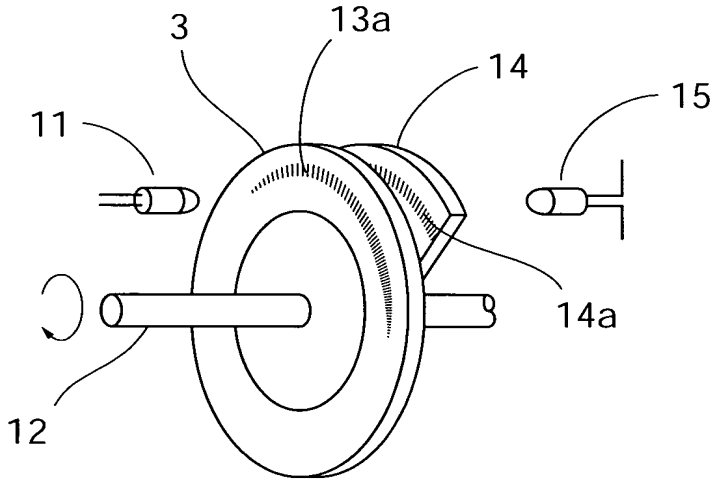


Fig. 4

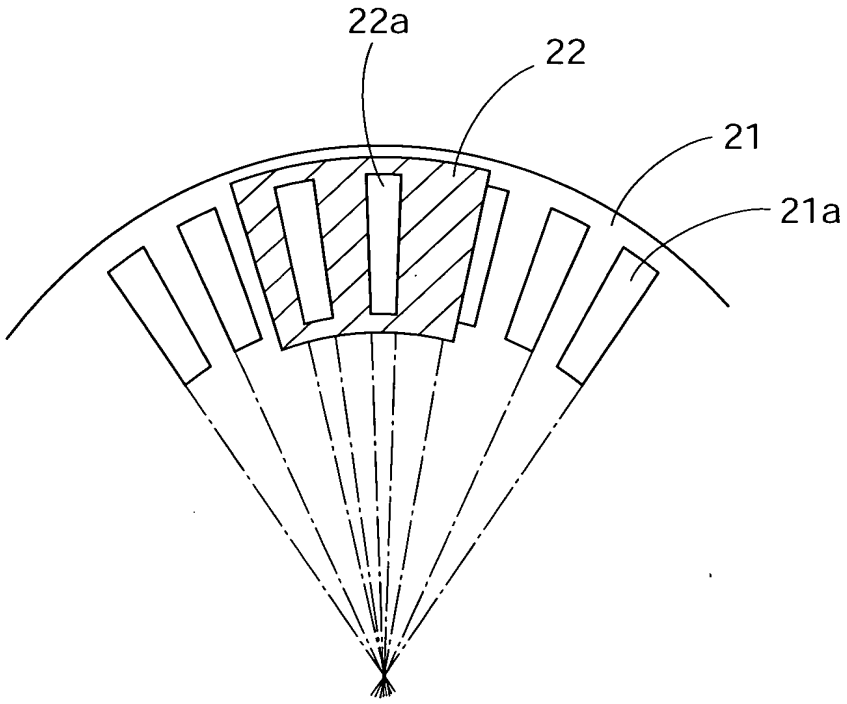


Fig. 5

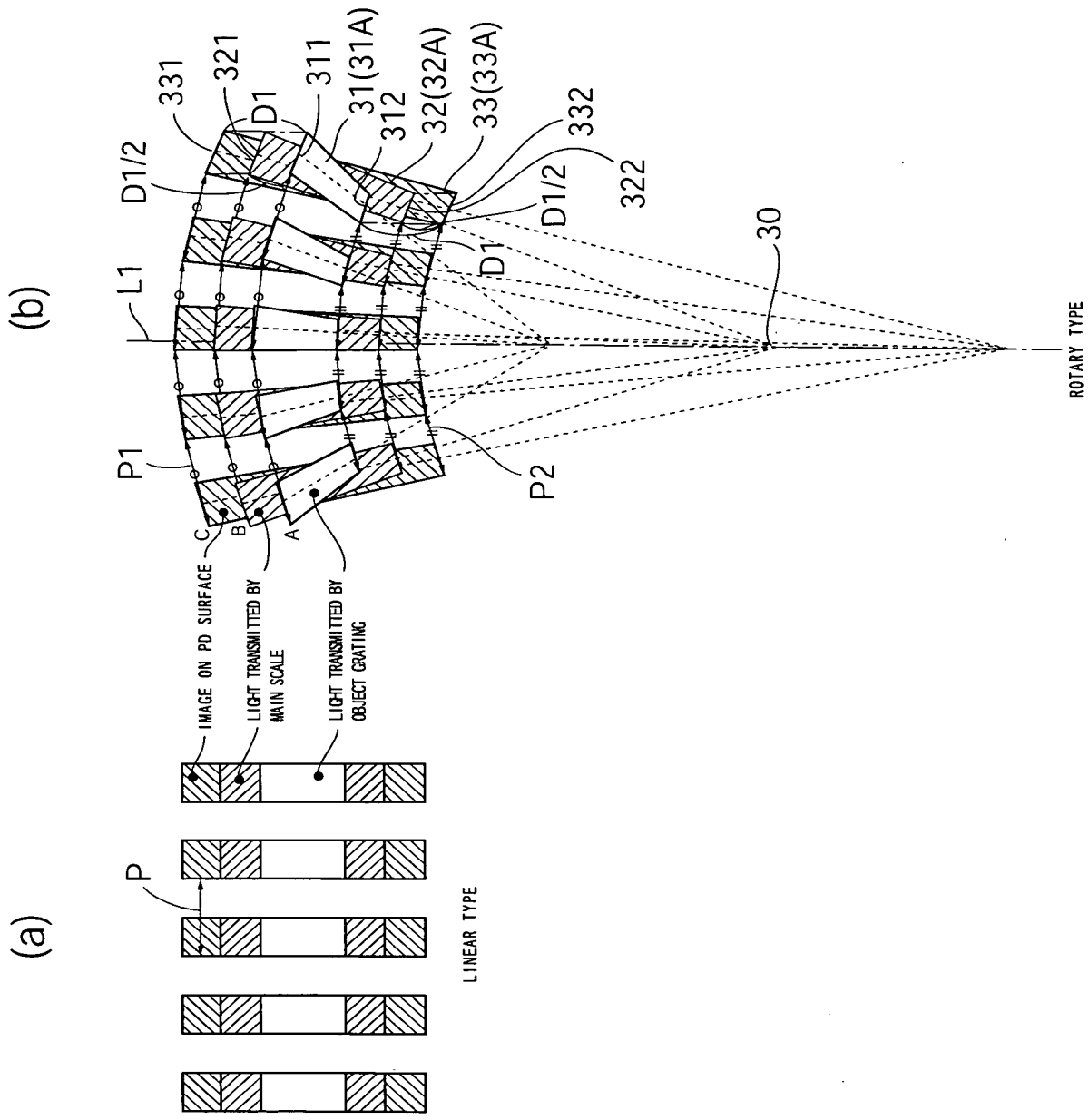

(a)
P
LINEAR TYPE
IMAGE ON PD SURFACE
LIGHT TRANSMITTED BY MAIN SCALE
LIGHT TRANSMITTED BY OBJECT GRATING
A
B
C
(b)
L1
P1
P2
D1/2
D1
331
321
311
31(31A)
312
32(32A)
33(33A)
332
322
30
ROTARY TYPE

Fig. 6

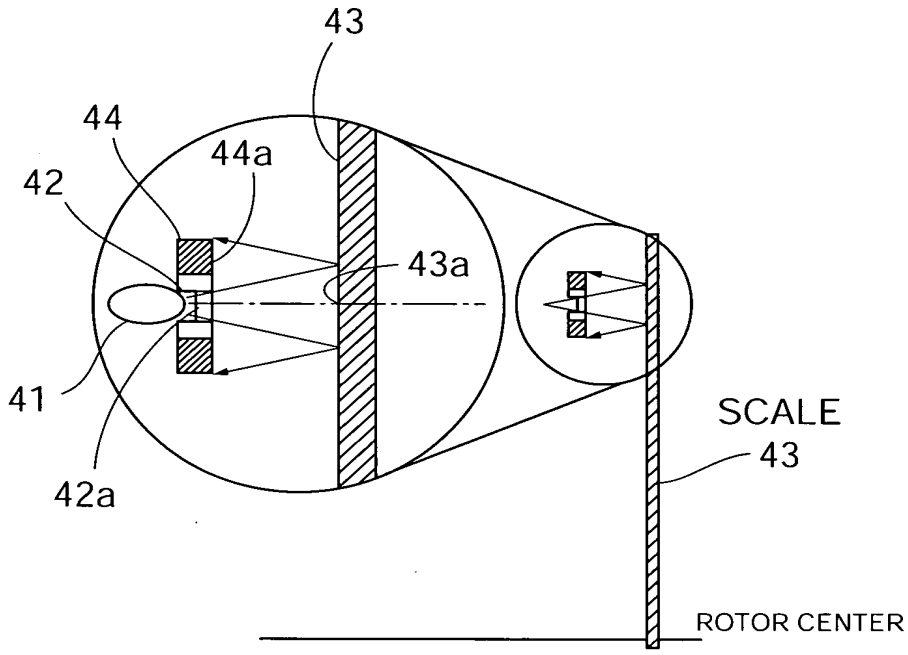


Fig. 7

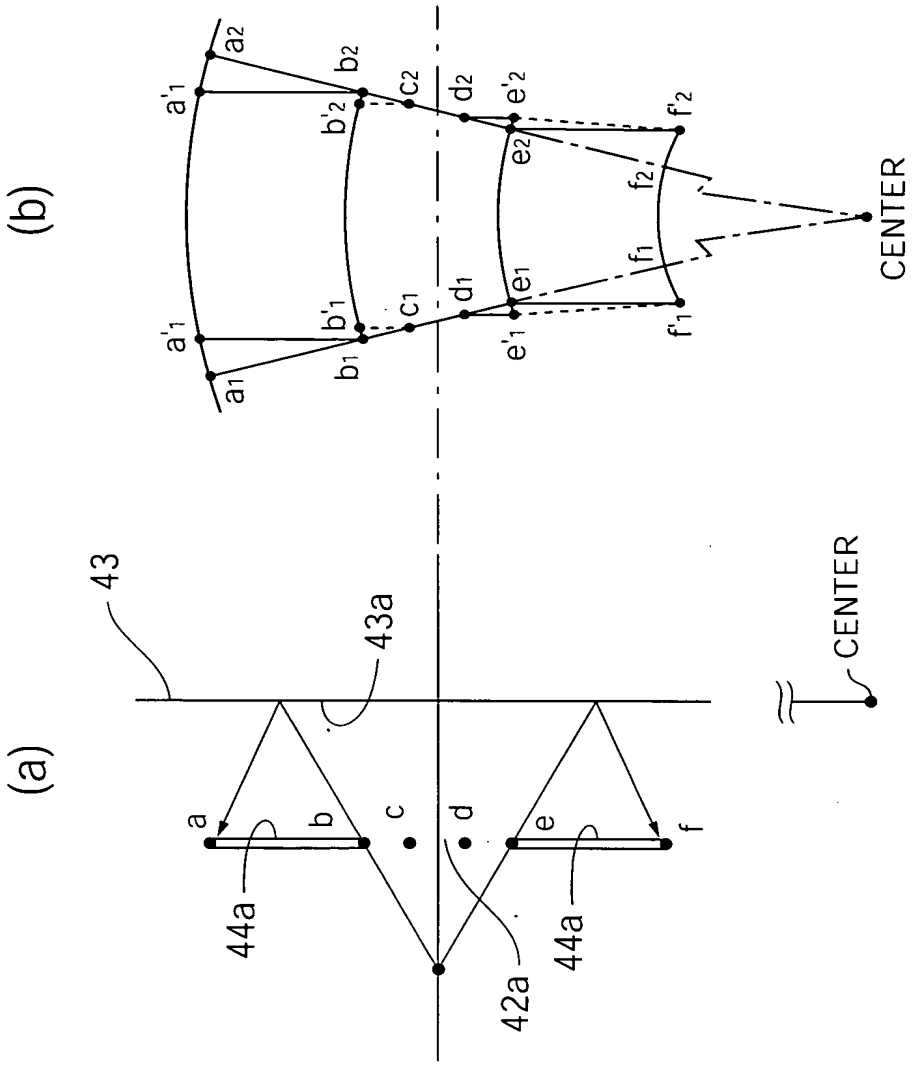
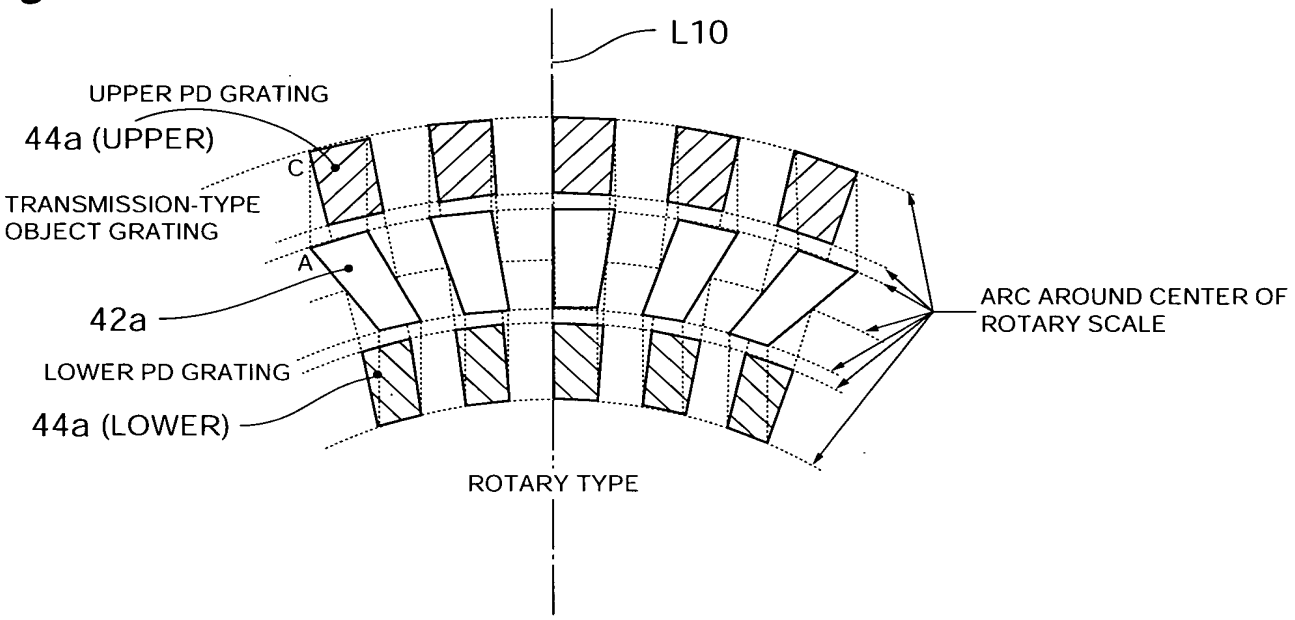

(b)
(a)
CENTER
CENTER
43
43a
a
b
c
d
e
f
44a
44a
42a
a'1
a2
b'2
b2
c2
d2
e'2
f'2
e2
f2
f1
e1
d1
c1
b'1
b1
a1
e'1
f'1

Fig. 8


L10
UPPER PD GRATING
44a (UPPER)
C
TRANSMISSION-TYPE
OBJECT GRATING
A
42a
LOWER PD GRATING
44a (LOWER)
ARC AROUND CENTER OF
ROTARY SCALE
ROTARY TYPE

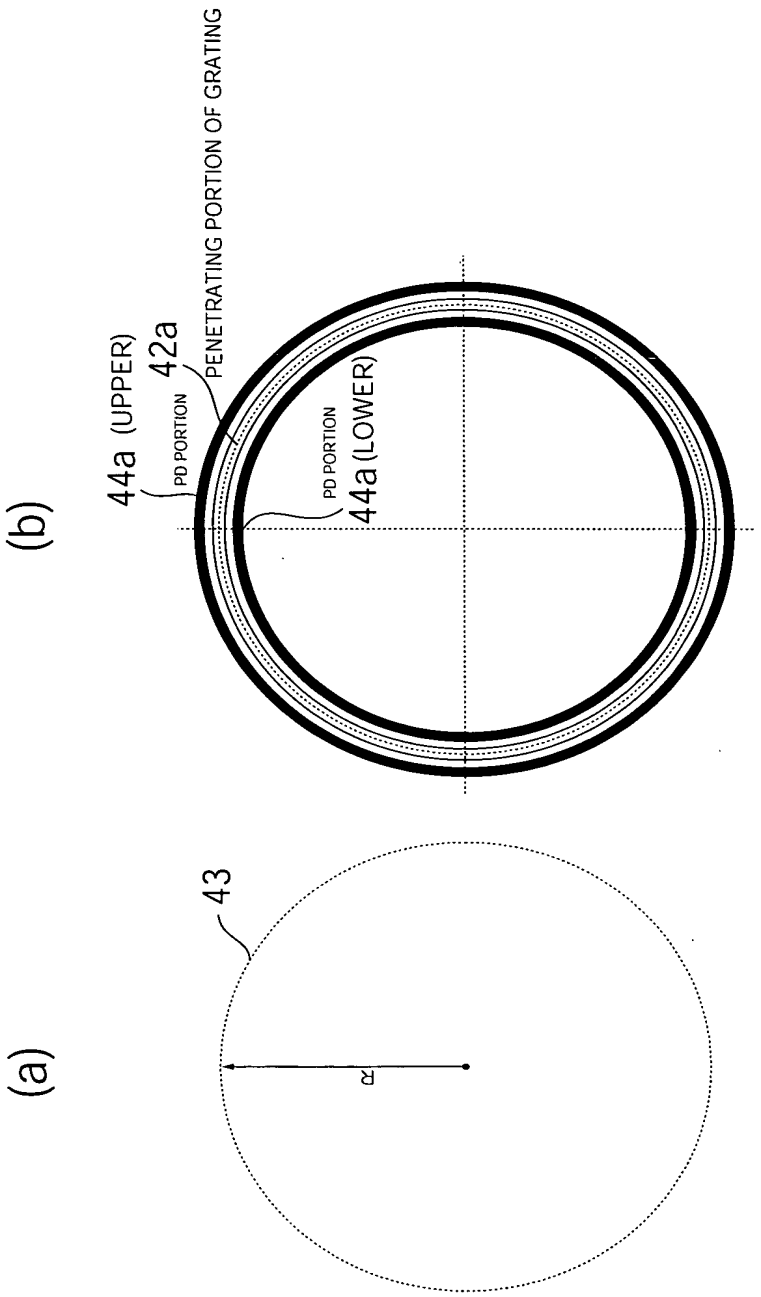

(b)
44a (UPPER)
PD PORTION
42a
PENETRATING PORTION OF GRATING
PD PORTION
44a (LOWER)
(a)
43
R

Fig. 9

Fig. 10

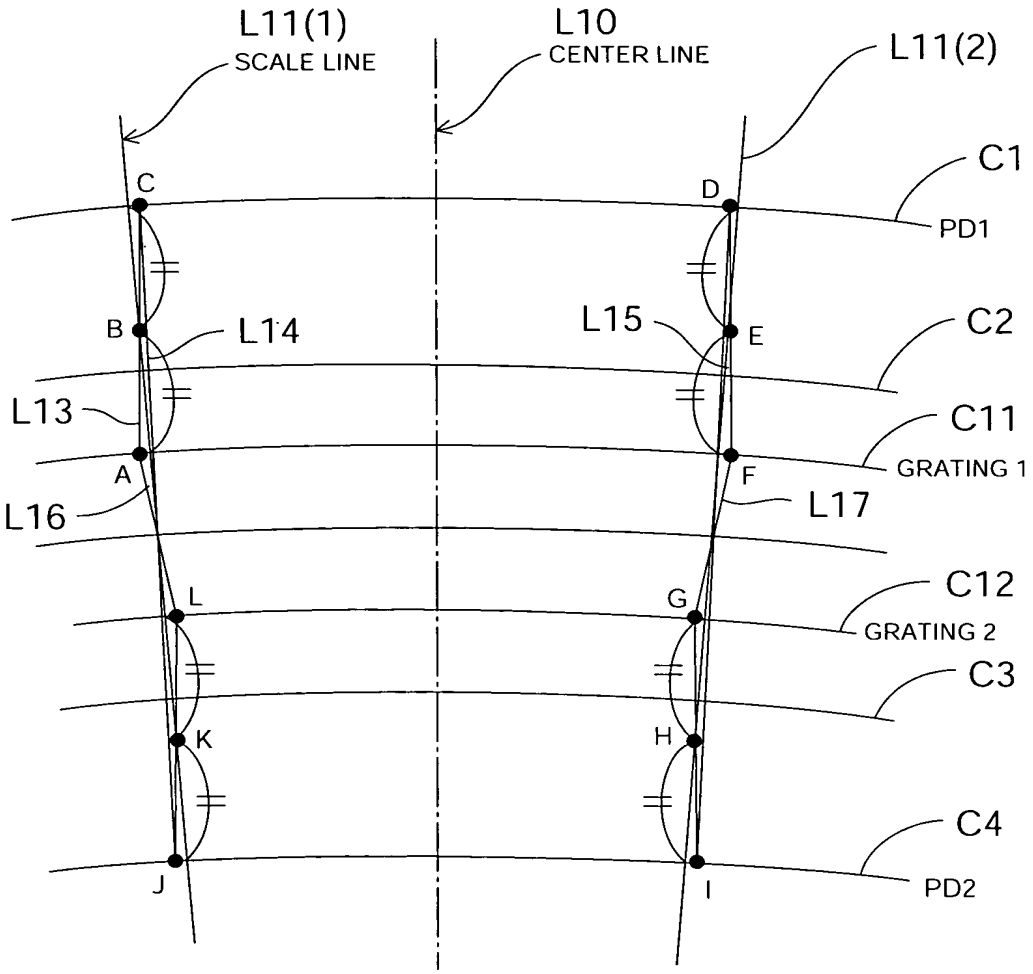
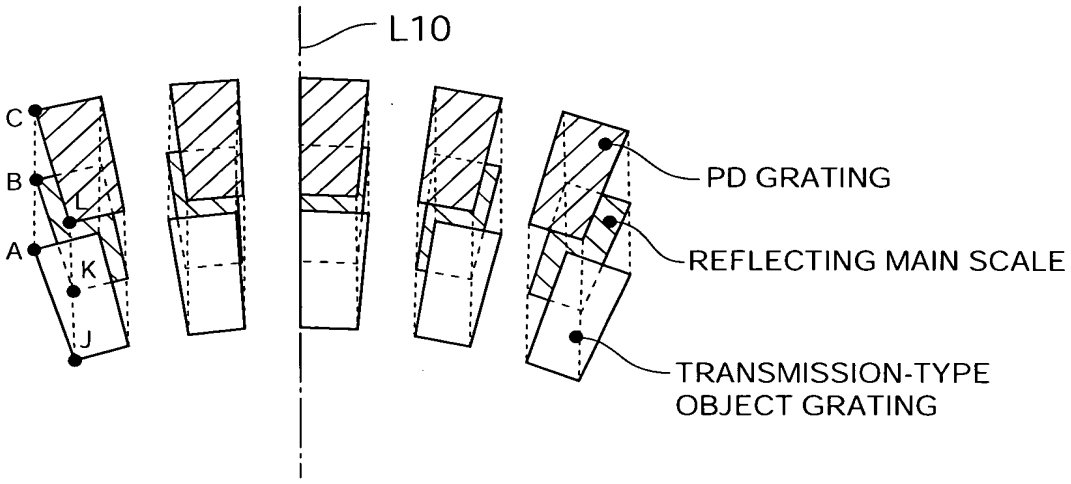

L11(1)
SCALE LINE
L10
CENTER LINE
L11(2)
C1
PD1
C2
C11
GRATING 1
C12
GRATING 2
C3
C4
PD2
L13
L14
L15
L16
L17
A
B
C
D
E
F
G
H
I
J
K
L

Fig. 11


L10
C
B
A
K
J
PD GRATING
REFLECTING MAIN SCALE
TRANSMISSION-TYPE
OBJECT GRATING